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As part of a continuing effort to improve existing methodology for development and use of occupational data gathering devices, this report considers the relative validity of two varied item formats for obtaining length of service data; specification in total months versus a combined years and months formulation. The later format was found to have much greater validity for relatively lengthy time periods but no significant difference was found for shorter periods. An alternative method for obtaining length of service data which employs a computer determination of elapsed time based on respondent provided dates is recommended for operational use. (Author)

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RELATIVE VALIDITY OF TWO ITEM FORMATS FOR OBTAINING LENGTH OF SERVICE DATA FROM JOB INVENTORIES

By

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RELATIVE VALIDITY OF TWO ITEM FORMATS FOR OBTAINING LENGTH OF SERVICE DATA FROM JOB INVENTORIES

I. INTRODUCTION

In the biographical information sections of both research and operational job task inventories, the recording of various total service periods, such as Total Active Federal Military Service (TAFMS), in terms of total months has resulted in the necessity to edit responses carefully or to tolerate some rather gross errors. While some of these errors are readily observable, particularly when of sizeable magnitude, others cannot be identified via any routine editing procedures and, hence, tend to bias certain classifications which might be of great value in the analysis of occupational data.

As one possible alternative to logging time in total months, survey respondents could be requested to reflect the time period in years and months. The initial purpose of this study was to investigate the hypothesis that specifying service periods in years and months would significantly increase the accuracy of the resultant data. For the purposes of this evaluation, criterion values for the two pertinent dates available for study were generated using the Uniform Airman Record (UAR) tape to compute actual airman service periods for TAFMS and Time at Present Base (TPB).

II. RESEARCH PROCEDURE

A job inventory, AFPT90-64X-069 (15 November 1971) for the Inventory Management (645X0/A) and Materiel Facilities (647X0) career ladders was constructed by the 3700th Occupational Measurement Squadron (ATC), Lackland AFB, Texas, and administered during November and December of 1971 to slightly under 6,000 personnel having representative assignments within these career ladders. This sample was randomly divided into two comparable subsamples approximately equal in number of cases: a control group, recording service period in the operational format of total months; and an experimental group, recording in the format of years and months. The job inventory booklets used in this study were identical with the single exception of format differences for recording TAFMS and TPB. Experimental booklets were identified with control numbers 0001-4095, whereas control booklets were identified with control numbers 5001-8821.

Following completion of the inventory booklets during an operational administration of the job inventories, routine editing of the responses was accomplished for both subsamples without regard for format differences. This resulted in a useable N of 2,173 for the control group and 2,509 for the experimental group.

Data from the control subgroup were keypunched directly onto cards for use in a Comprehensive Occupational Data Analysis Program (CODAP) analysis (Christal, 1972). Responses from the experimental group were converted using a computer program to yield the direct equivalency between the years and months reported and the total months represented. The total months were keypunched in the card positions used for the control sample, thus providing a simple method for direct analysis of the accuracy of the two reporting formats in addition to the normal job-type analyses.

Criterion values were developed from the 31 Dec 71 UAR tape. All job inventory respondents were matched on social security number, and the date entered military service and date arrived at present station were extracted. The date of inventory completion, as shown in the job inventory booklet, was subtracted from the UAR dates of interest and the difference converted to the nearest whole month using a computer program. The TAFMS thus obtained was compared to the incumbent specified time period and the differences in terms of error for the experimental and control groups were compared using a simple t-test of difference. This was the conventional one-tail t-test assuming larger mean error for the control subsample. Similar statistical procedures allowed for the evaluation of errors occurring in the determination of time at present base. Means, standard deviations, and the resulting t values are shown in Table 1 for both variables of interest.

Table 1. **Error Comparisons**

Test Statistics	TAFMS		TPB	
	Experimental	Control	Experimental	Control
mean error	1.5959	4.7322	1.3978	1.3051
std. dev.	7.8582	21.2647	6.6914	3.9109
n	2509	2173	2509	2173
t_{obs}	6.9886**		.5541	
	**p<.01		not significant	

III. DISCUSSION AND CONCLUSIONS

The difference in total months of error as a function of the recording format is highly significant for TAFMS. The experimental format of recording total time in years and months is preferable to total months only. For TPB, differences in format are not significant and no difference in accuracy as a function of the recording format is evident. The differences in format effect may be considered to be largely a function of the time intervals involved. TPB would normally be less than four years and it may be hypothesized that airmen generally tend to have little problem in converting years and months to total months for these smaller time increments. Additionally, it is probable that time intervals of this magnitude are thought of directly in a months formulation; *i.e.*, on base for 18 months, etc. Conversely, the large differences in TAFMS probably result from the respondents' inability to properly perform the mathematics necessary to convert years and months to total months as is required of the control group. In general, computation of the TAFMS requires remembering a date for longer time period and going through a more complex subtraction and encoding procedure than does computation of the TPB. The smaller error in the TPB is undoubtedly a simple result of personnel being able to remember the exact number of months over the relatively short time period involved.

For TAFMS, it would appear from this study that recording total time in years and months would be highly preferable to the present operational format. The same considerations would be applicable for any consecutive long term period. However, since recording in this format would require computer conversion, a second and more preferable alternative is available.

IV. RECOMMENDATIONS

It is recommended that TAFMS be recorded on all future experimental and operational job inventories as date entered military service in month and year. Similarly, any consecutive period of interest may be specified as date initiated, such as for TPB; the date arrived at present station. Date of inventory administration, presently punched in case card columns 1 through 5 should be considered an essential part of the basic file. The time periods of interest would then be developed through use of a revision to the Input Standard Program (INPSTD) of the CODAP system, allowing computer calculation of total time periods through a comparison of date entered with date of inventory administration. Tape format would thus be fully compatable with prior studies and date of inventory, as part of the basic file, would be readily available to facilitate data retrieval for other purposes.

REFERENCE

Christal, R.E. *CODAP: Input standard (INPSTD) and variable generation (VARGEN) programs.* AFHRL-TR-72-51, AD-750 144. Lackland AFB, Tex.: Personnel Research Division, Air Force Human Resources Laboratory, May 1972.